



SANTA BARBARA COUNTY ASSOCIATION OF GOVERNMENTS

INNOVATIVE CLEAN TRANSIT (ICT)
ZERO EMISSION BUS ROLLOUT PLAN



JUNE
2023

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LIST OF ABBREVIATIONS

ADA – American with Disabilities Act
BEB – Battery Electric Buses
CALACT – California Association for Coordinated Transportation
CARB – California Air Resources Board
CEQA – California Environmental Quality Act
CNG – Compressed Natural Gas
CONV - Conventional
CTA – California Transit Association
FTA – Federal Transit Administration
GHG – Greenhouse Gas
HFCB – Hydrogen Fuel Cell Buses
HVIP – Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project
ICT – Innovative Clean Transportation
kW – Kilowatt
kWh – Kilowatt Hour
LCTOP – Low Carbon Transit Operations Program
LowNo – Low or No Emission
LTF – Local Transportation Funds
NFPA – National Fire Protection Association
OEM – Originally Equipment Manufacturers
RTF – Regional Transit Facility
SB – Senate Bill
SBAPCD – Santa Barbara Air Pollution Control District
SCE – Southern California Edison
SCG – Southern California Gas
SCR TTC – Southern California Regional Transit Training Consortium
SGR – State of Good Repair
STA – State Transit Assistance
SBCAG – Santa Barbara County Association of Governments
TDA – Transportation Development Act
TIRCP – Transit and Intercity Rail Capital Program
VCTC – Ventura County Transportation Commission
VW- Volkswagen
ZEB – Zero Emission Buses
ZEV – Zero Emission Vehicles

SECTION A: TRANSIT AGENCY INFORMATION

Transit Agency's Name	Santa Barbara County Association of Governments
Mailing Address	260 N. San Antonio Road, Suite B Santa Barbara, CA 93110
Name of Transit Agency's Air District(s)	Santa Barbara County Air Pollution Control District
Contact Information	Aaron Bonfilio Director of Rail and Transit Programs (805) 961-8900 ext 1820 abonfilio@sbcag.org
Is your agency part of a Joint Group (13 CCR§2023.1 (d)(3))?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

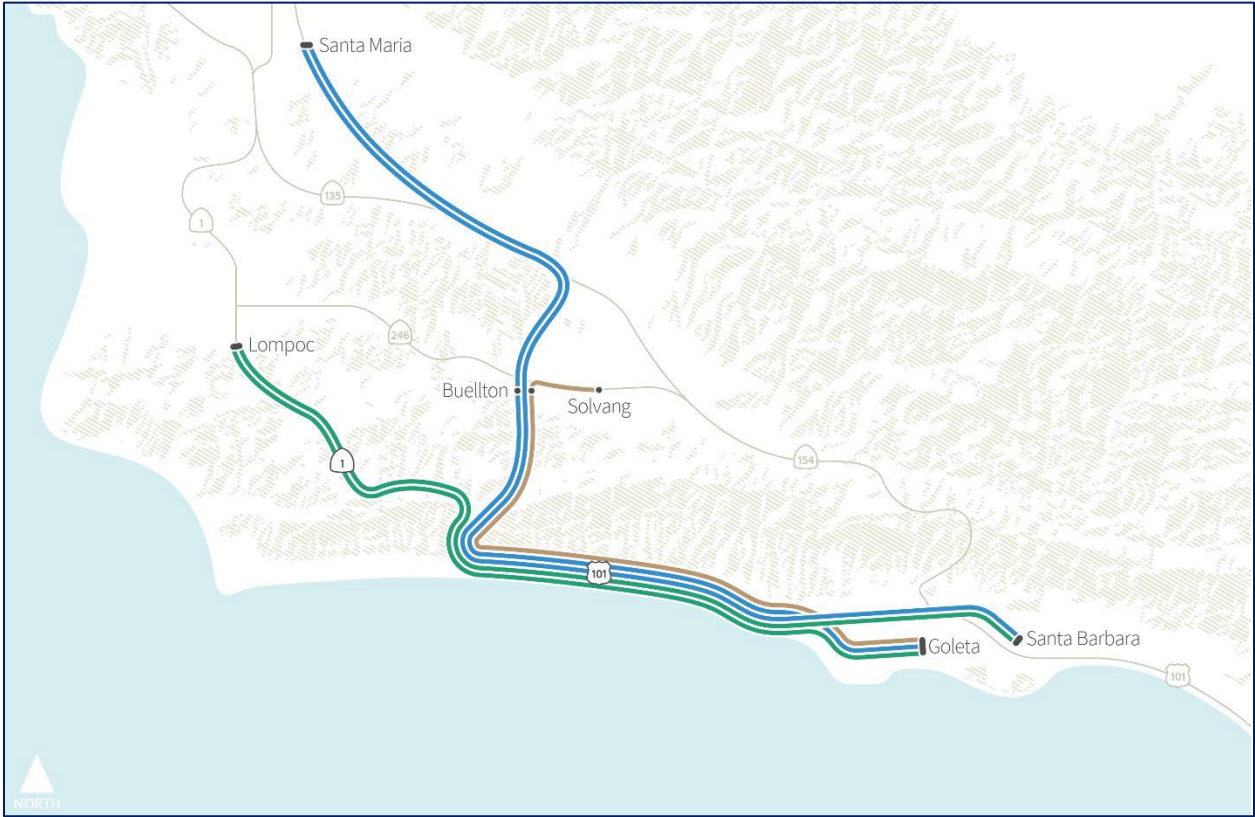
Background and Description of Clean Air Express Service

The Clean Air Express is a commuter bus service serving North Santa Barbara County communities whose residents work in and commute to Goleta and Santa Barbara. The Santa Barbara County Association of Governments (SBCAG) funds, manages, and administers the Clean Air Express. The Clean Air Express was launched in 1989 as a technology demonstration program by the Santa Barbara County Air Pollution Control District. The service was transferred to SBCAG in 2001. A private contractor operates the service and maintains the SBCAG-owned buses under contract with SBCAG.

Historically, the Clean Air Express has provided service to employment locations in Goleta and Santa Barbara from residential communities in North Santa Barbara County. Santa Barbara County has a population of approximately 448,229 and approximately 2,735 miles in land area. Prior to the COVID-19 Pandemic, Clean Air Express provided approximately 179,000 trips annually, across thirteen roundtrips operated each weekday (with seven roundtrips serving Lompoc, five roundtrips serving Santa Maria and one roundtrip serving Solvang). Service levels were reduced in 2020 and currently Clean Air Express operates a total of ten roundtrips per day (five serving Lompoc and five serving Santa Maria). The Clean Air Express fleet is made up of eighteen (18) over-the-road motor coaches, including seventeen (17) diesel engine buses and one (1) zero emission battery-electric bus. Clean Air Express does not operate on weekends, although Saturday service was piloted in 2016/17 before being terminated due to low ridership. In light of the shift in travel behavior coming out of the pandemic, staff is examining further potential service adjustments and route modifications to increase ridership and/or reduce costs.

The Clean Air Express service area and route map is reflected in Exhibit A.1.

Exhibit A.1 Clean Air Express Routes



[Pre-pandemic Route Schematic, January 2020]

SECTION B: ROLLOUT PLAN GENERAL INFORMATION

The California Air Resource Board's (CARB) Innovative Clean Transportation (ICT) regulation requires all public transit agencies in the State of California to gradually transition from conventional buses to a 100% zero-emission buses (ZEB) fleet by 2040. The regulation requires a progressive increase of an agency's new bus purchase of ZEB based on their fleet size. Beginning in 2029, 100% of new purchases by transit agencies must be ZEB to meet the full transition by 2040.

To ensure that each agency has a strategy to comply with the 2040 requirement, the ICT regulation requires each agency, or a coalition of agencies ("Joint Group"), to submit a ZEB Rollout Plan (Rollout Plan) before the purchase requirements take effect. The Rollout Plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include a number of required components (as outlined in the Rollout Plan Guidelines) and must be approved by the transit agency's governing body through the adoption of a resolution, prior to submission to CARB.

The Santa Barbara County Association of Governments' ZEB Rollout Plan ensures that SBCAG will make a complete transition to ZEB by 2040. Additionally, this plan accounts for delivery timelines ranging from six (6) to twenty-four (24) months and confirms that the fleet will not be retired before reaching their useful life. SBCAG's replacement schedule does not allow for delivery of conventional buses after 2024. The retirement schedule is based on the replacement of diesel buses with ZEB beginning 2026, which will allow the fleet to be 100% replaced with ZEB by 2032.

The SBCAG ZEB Rollout Plan is designed to achieve the CARB full transition to ZEB and technologies by 2040 that avoids early retirement of conventional buses (13 CCR § 2023.1(d)(1)(A)). This plan, which was prepared by SBCAG staff, was approved by the Board of Directors on June 15, 2023. A copy of the resolution is attached in Appendix A.

In addition, SBCAG worked with Southern California Edison (SCE), several bus manufacturers, consultants, and local and regional transit agencies, which have planned for or transitioned and implemented ZEB and technologies, to create a plan that considers the SBCAG's Current Bus Fleet Composition and Future Fleet Purchases, Facilities and Infrastructure Modifications, Workforce Training, Potential Funding Sources, and Start-up and Scale-up Challenges.

SECTION C: TECHNOLOGY PORTFOLIO

SBCAG's fleet consists of seventeen (17) diesel motor coaches and one (1) zero emission battery-electric motor coach for a total of eighteen (18) buses. SBCAG's transition to a zero-emission fleet will be by integrating battery-electric buses (BEB) into the fleet as the diesel buses reach their respective useful life.

In Fiscal Year 2021/2022, SBCAG began transitioning its Clean Air Express fleet to battery electric buses (BEB). SBCAG received a combination of State grant funds to purchase a single battery-electric motor coach. In addition, SBCAG is installing four BEB vehicle chargers Summer 2023 at SBCAG's Regional Transit Facility (RTF), located in Goleta, CA. These chargers are getting installed as part of a Transit and Intercity Rail Capital Program (TIRCP) grant funded project to deploy five BEB in the Coastal Express service, which is operated by the Ventura County Transportation Commission (VCTC) and funded in a partnership between VCTC and SBCAG. The RTF also serves as a mid-day depot for the Clean Air Express.

The ZEB transition effort by SBCAG will take place between 2024 and 2032, during which all Clean Air Express buses are fully replaced by BEB. The new BEB available this calendar year 2023 appears to meet the service requirements of existing Clean Air Express service parameters. However, any increases in vehicle duty cycle (i.e., to operate more miles per bus, per day) would exceed existing battery range. The Rollout Plan anticipates that BEB range will continue to improve between 2023 and 2032, and further increase their range after 2032. To address this, SBCAG will monitor service levels, plan for midday and overnight charging at existing and planned depot facilities and, consider addition of "in-route" charging (also known as opportunity charging) which could allow Clean Air Express fleet to operate more continuous service without returning to depot charging facilities.

To account for potential power availability concerns, such as public safety power shutoffs, rolling blackouts or unplanned power outages, SBCAG will retire a portion of its existing diesel fleet to a contingency fleet once it has reached the end of its useful life. It also plans to keep one industrial-size mobile solar generator available for emergency power needs. In addition, SBCAG plans to partner with Cities of Lompoc, Santa Maria and Solvang with the development of redundant power sources for BEB. These actions will allow SBCAG to have confidence that there are options available during unexpected or emergency situations.

As technology evolves, this Rollout Plan will be updated to reflect the changes made and adopted by SBCAG.

California Air Resources Requirements:

Transit agencies must purchase or operate a minimum number of ZEB as determined by the transit agency fleet size. A small transit agency, such as SBCAG, is required that 25% of the total number of new bus purchases in calendar years 2026 -2028 must be ZEB. Then, starting 2029, it is required that 100% of new bus purchases must be ZEB. If a transit agency voluntarily purchased zero-emission version of these types of buses ahead of their purchase requirement, they will still be counted towards the minimum number of ZEB in the year of purchase to recognize their purchases. To-date SBCAG purchased a single ZEB in 2022. Furthermore, CARB requires all California transit agencies, regardless of size, to submit and update their agency and bus fleet information and purchases every March.

SECTION D: CURRENT BUS FLEET COMPOSITION AND FUTURE BUS PURCHASES

The SBCAG Clean Air Express fleet consists of eighteen active motor coach buses, including one BEB.

Exhibit D.1 Individual Bus Information of Current Bus Fleet

BUS NO.	MODEL YEAR	FUEL TYPE	BUS MANUFACTURER	BUS TYPE
867	2011	Renewable Diesel	MCI	Motor Coach
868	2011	Renewable Diesel	MCI	Motor Coach
869	2011	Renewable Diesel	MCI	Motor Coach
771	2012	Renewable Diesel	MCI	Motor Coach
772	2012	Renewable Diesel	MCI	Motor Coach
773	2012	Renewable Diesel	MCI	Motor Coach
774	2012	Renewable Diesel	MCI	Motor Coach
775	2012	Renewable Diesel	MCI	Motor Coach
776	2012	Renewable Diesel	MCI	Motor Coach
657	2015	Renewable Diesel	MCI	Motor Coach
876	2015	Renewable Diesel	MCI	Motor Coach
877	2015	Renewable Diesel	MCI	Motor Coach
655	2015	Renewable Diesel	MCI	Motor Coach
656	2015	Renewable Diesel	MCI	Motor Coach
623	2017	Renewable Diesel	MCI	Motor Coach
624	2017	Renewable Diesel	MCI	Motor Coach
625	2017	Renewable Diesel	MCI	Motor Coach
8003	2021	Battery Electric	BYD	Motor Coach

The total number of buses to be purchased through 2034 and the percentage of those expected to be ZEB are presented in Exhibit D.2. The fleet is expected to 100% transitioned to ZEB by 2032.

At this time, BEB manufacturers are reporting that delivery period between one to two years from the date of order, citing increased demand due to CARB mandated and Federal Transit Administration (FTA) prioritization of ZEB. In order to comply with the SBCAG Transit Asset Management Plan and FTA vehicle useful life standard, SBCAG would need to order ZEB sometime during 2024 for its first upcoming diesel buses replacement in 2025.

Exhibit D.2 Future Purchase of Clean Air Express Buses

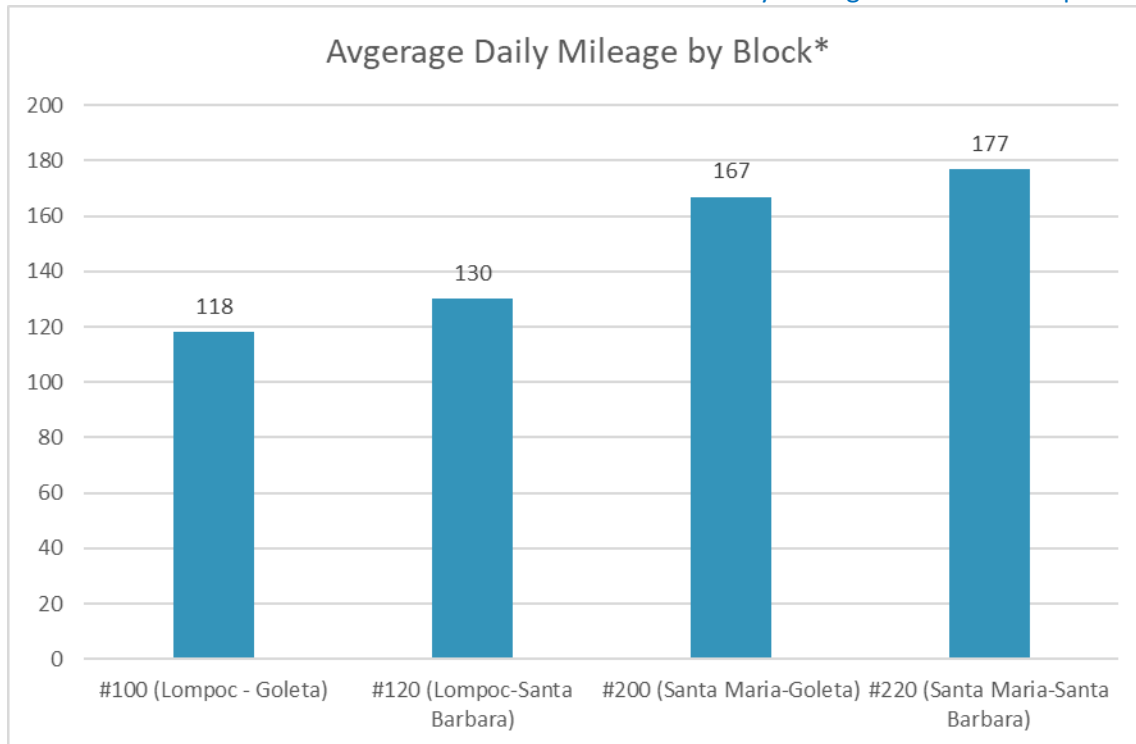
Timeline (Order Year)	Total Number of Buses to Purchase	No. of ZEB Purchases	Percentage of Annual ZEB Purchases	ZEB Bus Type	ZEB Fuel Type
2024	3	3	100%	Motor Coach	Battery-electric
2025	6	6	100%	Motor Coach	Battery-Electric
2028	5	5	100%	Motor Coach	Battery-Electric
2031	3	3	100%	Motor Coach	Battery-Electric
Total Amount		17			

Range of Service for Clean Air Express Routes

Currently, SBCAG Clean Air Express buses operates an average of 147 miles per service day. Daily mileage including deadhead ranges from 118 to 177 miles per bus. Exhibit D.4 shows the average mileages for the Clean Air Express by vehicle block, based on bus rollouts during April 2023.

The Service Assessment shows that existing Clean Air Express service levels can be operated by BEB. However, if any expansion occurs either by adding trips (or significantly extending blocks 200 and 220), depot-charged BEB range would be insufficient. The maximum range for existing BEB motor coach technology is approximately 225 miles between charges. This has additionally been validated by SBCAG through use of the agency’s existing BEB. However, as the range of BEB are expected to improve, BEB may eventually meet such service requirements. Additionally, such expansion range issues could be managed with in-route charging or schedules that accommodate depot charging.

Exhibit D.3 Daily Mileage for Clean Air Express Buses



*Daily Mileage includes revenue and non-revenue miles. Block #300 (Solvang-Goleta) currently suspended; prior daily mileage 108mi.

Current Vehicle Costs

The cost of BEB is evolving as is the range as more powerful and more efficient batteries are being produced. For planning purposes, this Rollout Plan is projecting a “high-end” of the range cost (not including the one-time cost of adding charging infrastructure). The ZEB purchase cost appears to be approximately \$200,000 more than comparable diesel vehicles (not including tax incentives or rebates). While SBCAG has limited experience with the “lifetime” costs of BEB, there is an expectation that they will be less than the cost of the diesel fleet assuming operating and maintenance costs are less.

SBCAG considered the alternatives of both BEB and Hydrogen Fuel Cell Buses (HFCB) in preparing its ZEB plan. The decision to choose the BEB path was based on several criteria. This includes the cost of the buses, infrastructure cost, fueling space requirements, local and regional fueling environment, and the phasing of fueling infrastructure. The BEB support infrastructure is to a large degree scalable, meaning that SBCAG can add chargers as its fleet changes. Moreover, all three neighboring transit agencies have selected BEB for their ZEB fuel path and will be implementing compatible fueling (charging) infrastructure. The City of Lompoc, for example, will be building a new transit operations and maintenance facility which includes charging capacity for over half of the Clean Air Express fleet vehicles.

Hydrogen fueling is further expensive, complex in operation and will necessitate purchase and development of storage tank and fueling infrastructure. SBCAG can either truck in liquid hydrogen, which will require a compressor, or generate hydrogen on site, which will require a facility that has an estimated cost of \$5-7M. SBCAG can construct the storage tank and truck in hydrogen until most or all of the fleet are converted to HFCB vehicles, but there is no guaranteed availability or scalability. In this case, SBCAG will have to construct a fueling infrastructure in a constrained transit facility which will be a challenge. There are no locations at the site that conforms to the National Fire Protection Association (NFPA) 2 code restrictions, which requires offset distances, for example between hydrogen equipment and buildings electrical power lines, and the property line. The hydrogen storage and compressor equipment needs to be surrounded by firewalls to reduce NFPA 2 separation distances. Construction will also require removal of transit fleet parking spaces and the possibility of constricting the transit traffic flow. The parking space is already near capacity; therefore, removing the spots may not be feasible. Clean Air Express transit operations is relatively small, and the cost of constructing a hydrogen fueling station is not economically viable for the small fleet that SBCAG operates. On a positive, HFCB range is longer than BEB, and the refueling time are much quicker.

The BEB batteries are making significant improvements in their range and charging time. With the current available BEB, SBCAG can provide service with overnight or mid-day depot charging. SBCAG has an option to buy its electricity from SCE, at the State mandate discounted rates for transit agencies, or generate its own electricity by installing solar panels and battery storage for an “off-grid” solution. This will require additional upfront funding but will eventually reduce the electrical cost as well as provide contingency during utility network failures and shutoffs.

Future Assumptions

The following assumptions are made as SBCAG considers the BEB:

- It is assumed that there will be a 5% improvement in battery capacity every two (2) years with a starting battery capacity of 446 kWh, which is the current battery capacity in 45-foot commercially available motor coaches in 2023.
- The transit routes served by SBCAG will not significantly change. Route lengths, relative speeds, and elevation changes will generally be unchanged from those currently/previiously in operation even if specific routes and schedules change.
- The fleet composition will generally consist of 45-foot over the road motor coaches. Based on SBCAG’s Transit Asset Management Plan, the motor coaches have 14-year useful life.
- In determining the range of BEB, the usable on-board energy is assumed to be that of a mid-life battery (10-20% degraded) with a reserve at both the high and low end of the battery’s charge

potential. As previously discussed, battery age affects range, so a mid-life battery was assumed as the average capacity of the battery’s useful life. Charging batteries to 100% or dropping the charge below 10% also degrades the batteries over time, so the analysis assumes that the top and bottom portions of the battery are unusable.

SBCAG can mitigate the range requirement issue by installation of “in-route” chargers at selected locations, should expansion of service need to take place. An “in-route” charger consists of an induction pad placed in or above the street, which will allow the buses to stopover to partially recharge their batteries. This may not be necessary when battery range is enhanced over time as SBCAG replaces the Clean Air Express fleet. The below table reflects the transition needs for the current level of service.

Exhibit D.4 Wireless Inductive Charging Roadway Embedded Pad



Exhibit D.5 Range and Estimated Cost

Timeline (Year)	Number of ZEB	ZEB Bus Type	ZEB Fuel Type	Required Range	Estimated Costs/bus
2024	3	Motor Coach	Battery-Electric	≤ 225 miles	\$1,075,000
2025	6	Motor Coach	Battery-Electric	≤ 225 miles	\$1,075,000
2028	5	Motor Coach	Battery-Electric	≤ 225 miles	\$1,075,000
2031	3	Motor Coach	Battery-Electric	≤ 225 miles	\$1,075,000

All costs are in 2023 dollars

SBCAG does not intend to convert any of its conventional fleet to ZEB. As buses reach their respective useful life, they will be replaced with BEB. Based on present schedules (and daily mileage), the current and planned services can be operated with the existing and/or near-term expected vehicle ranges; SBCAG will be able to maintain a one for one replacement.

Exhibit D.6 SCE New EV Charging Rates

SCE's New EV Rates – no demand charges through 2024

Highlights of new EV rates

- No demand charges from 2019-2023. Demand phases back in from 2024-2029.
- Save money by avoiding the peak hours of 4pm-9pm.
- New Super Off-Peak period with lowest pricing during 8am-4pm from October – May.
- You can estimate your electricity costs using SCE's Fleet Fuel Calculator, fleetfuelcalculator.sce.com.
- Speak with your SCE Account Manager or EV Advisory for more rate details at your site.

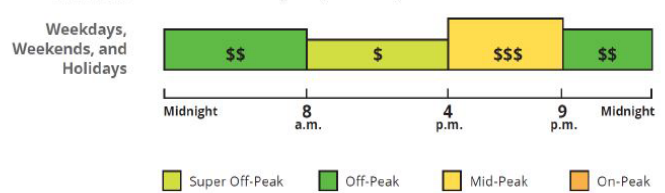
SUMMER

June 1 – September 30 (4 Months)



WINTER

October 1 – May 31 (8 Months)

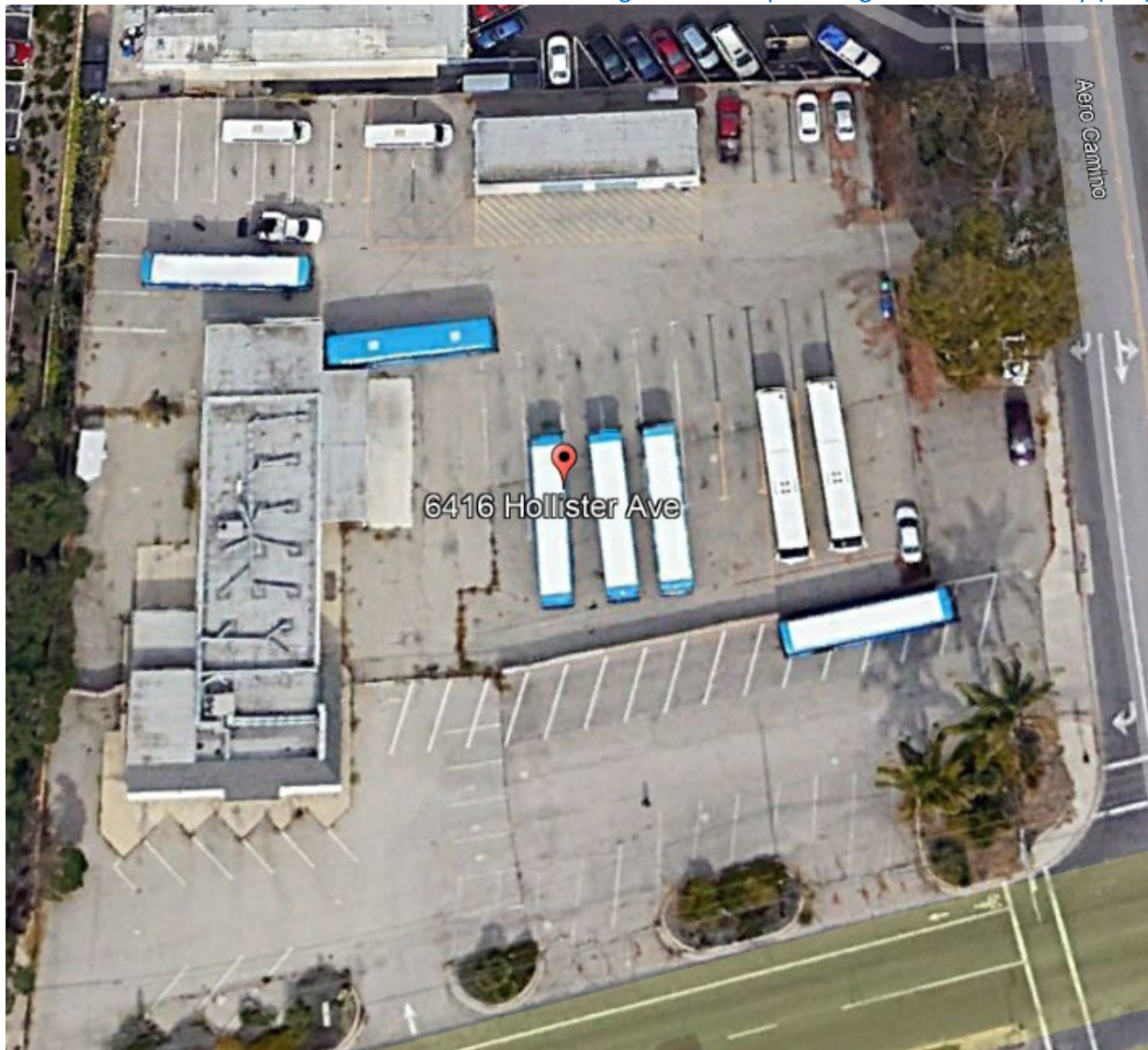


■ Super Off-Peak
 ■ Off-Peak
 ■ Mid-Peak
 ■ On-Peak

SECTION E: FACILITIES AND INFRASTRUCTURE MODIFICATIONS

In 2021, the Santa Barbara County Association of Governments purchased the Regional Transit Facility (RTF) located at 6416 Hollister Avenue, Goleta CA, 93117. This facility provides mid-day depot support for the Clean Air Express, as well as the VCTC Coastal Express. It currently has 1 DC Fast-charger and will soon have four additional chargers (2 DC Fast-chargers with two ports each, and 2 Level-II chargers).

Exhibit E.1 Existing Clean Air Express Regional Transit Facility (RTF)



In addition to the Regional Transit Facility (RTF) in Goleta, Clean Air Express overnight parking and garage locations include: 513 E Chestnut Ave, Lompoc, CA 93436; 500 West Foster Road, Santa Maria, CA 93455; and a contract provided facility at 200 Longbranch Avenue, Grover Beach, 93433. As the Clean Air Express fleet transitions to more BEB, charging infrastructure will expand at the RTF. Additionally, charging infrastructure will be installed on an as needed basis at City and County-owned facilities, such as at the Clean Air Express overnight parking locations.

Exhibit E.2 Facilities Information and Construction Timeline

Facility Name	Address	Main Function	Types of Infrastructure	Service Capacity (Buses)	Needs Upgrade	Estimated Construction Timeline
SBCAG Regional Transit Facility (RTF)	6416 Hollister Avenue, Goleta CA 93117	Transit Operations, and Maintenance Facility	Transformer, Conduit, Switch Gear, 1440 kw Charger System	9 Dispensers	Yes	Phase 1: 2025
NEW City of Lompoc Transit Facility (COLT)	513 E Chestnut Avenue, Lompoc CA 93436	COLT Shared Operations and Maintenance Facility	Transformer, Conduit, Switch Gear, 1440 kw Charger System	10 Dispensers	Yes (New Facility)	Phase 2: 2028

Infrastructure upgrades to accommodate BEBs are required at the RTF. These improvements are planned in phases to incrementally expand as new zero emissions buses are introduced into the fleet. SBCAG will complete a full base infrastructure build out in phase 1; this will include electrical system upgrades, installation of a new transformer, parking lot repaving and restriping, and the installation of conduit and wiring for managed bus charging. As more funding becomes available, SBCAG will purchase additional chargers to accommodate the growing zero emissions fleet.

To accommodate the replacement of all remaining Clean Air Express buses, chargers will be installed at the new COLT Operations and Maintenance facility as part of phase 2, which is planned to include infrastructure to charge up to ten Clean Air Express buses.

As noted above, the process will be completed in phases to manage the capital outlay, be timed to occur with vehicle delivery and to ensure that SBCAG is leveraging and implementing the latest technology available at the time.

Exhibit E.3 Example of Bus Charging Stations

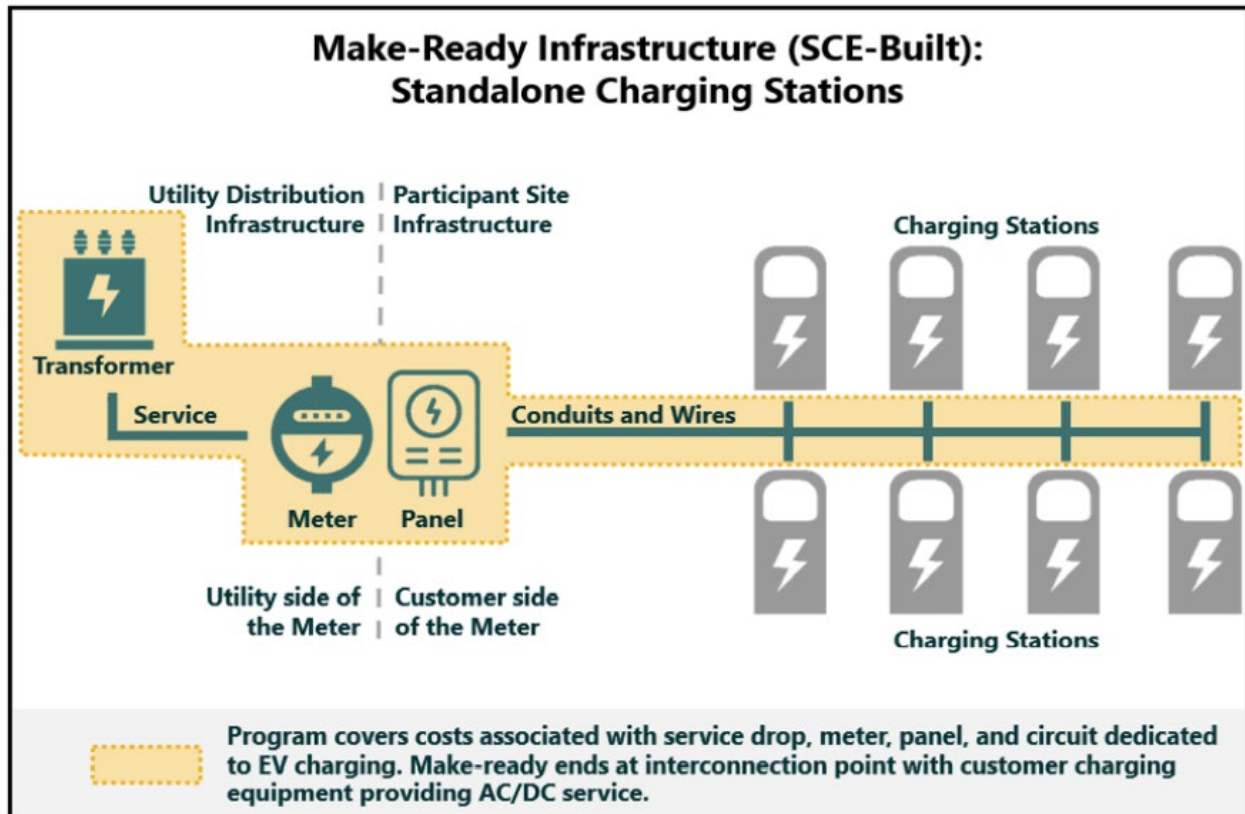


Off Grid Solar Option

SBCAG has a key decision to make regarding future phased installations of electric charging equipment at the RTF. The decision is whether to have the SCE install the entire charging system, or to have them bring the necessary electric infrastructure and meter up to the perimeter fence, but not install the actual chargers within the RTF.

The first alternative would simplify the process for SBCAG and could reduce installation and charger costs. However, such an approach may pre-empt SBCAG from being able to change the way it acquires electricity for said chargers (such as through the use of on-site solar panels).

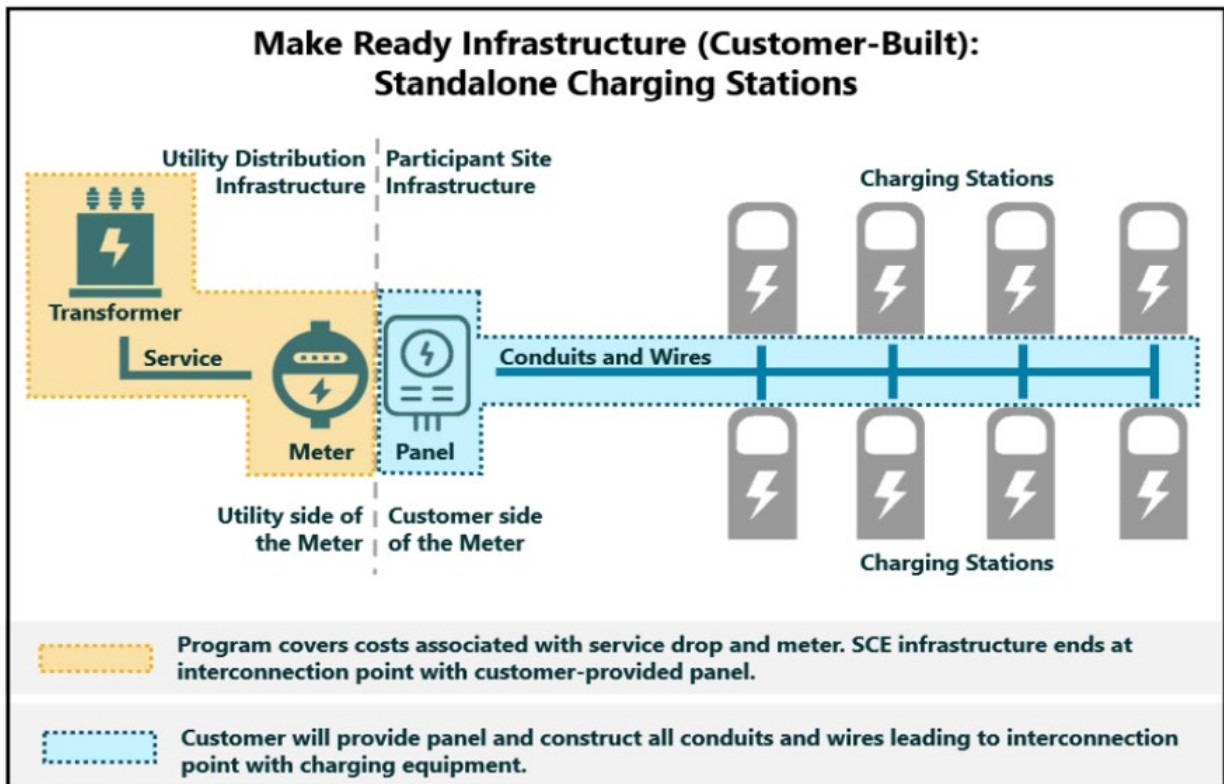
Exhibit E.4 Make-Ready Infrastructure (SCE-Built) Standalone Charging Stations



The second alternative is to have SCE install the electrical distribution system infrastructure up to the meter, and the panel and charging stations are the responsibility of SBCAG. This would allow SBCAG to transition from SCE grid to solar power or other electric sources at a future date.

If SBCAG chooses the option of installing its own electric panel and charging stations, it will be eligible to receive financial assistance from SCE for the chargers. The rebate amount will depend on the chargers' model, level, and cost, and if they are under the SCE approved charger list.

Exhibit E.5 Make-Ready Infrastructure (Customer-Built) Standalone Charging Stations



The determination of which path to take in the installation of electric charging stations will be analyzed over the coming years. With initial BEB deployments, charging requirements are met relatively easily with a handful of plug-in pedestal chargers and small infrastructure investment. Scaling to a large BEB deployment requires a more substantial infrastructure upgrade and smart charging software.

At present, SBCAG has no identified source of funding for the construction of solar panels, storage batteries, and micro-grid to support the transit system; but will further investigate and research. Consequently, when source of funding is identified, the system will both reduce the long-term cost and provide reliable source of power in case of emergencies such as natural disasters, which could otherwise disrupt the energy supply.

SECTION F: PROVIDING SERVICE IN DISADVANTAGED COMMUNITIES

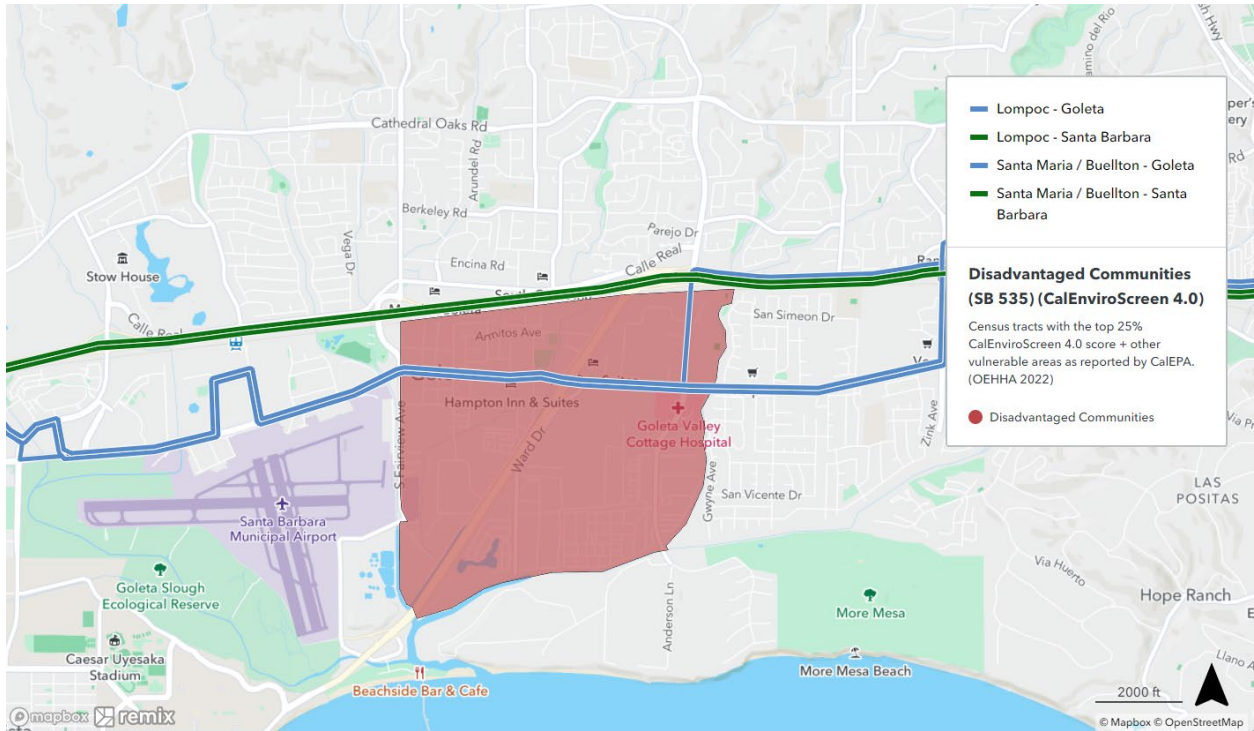
According to the California Office of Environmental Health Hazard Assessment, the disadvantaged communities are defined as the top 25% scoring areas from CalEnviroScreen along with other areas with high pollution and low populations. CalEnviroScreen is a tool that was developed to identify communities disproportionately impacted by multiple sources of pollution.

Exhibit F.1 Disadvantage Communities (DAC, SB 535) in Santa Barbara County



Based on CalEnviroScreen 4.0, there are two disadvantaged communities (DAC) located within Santa Barbara County. Clean Air Express provides service to one of the two DAC, which is in Goleta CA, in an area known as 'Old Town'.

Exhibit F.2 Clean Air Express Service in Disadvantage Communities (DAC, SB 535)



The Clean Air Express has operated to/from the Old Town Goleta area for over twenty years. There are two Clean Air Express routes with stops in each direction along Hollister Avenue that serve this Census tract. SBCAG intends to maintain these stops for the foreseeable future as the stops are highly productive in terms of ridership and serve adjacent jobs, residents, and businesses efficiently. Currently the single BEB in the Clean Air Express fleet is rotated through the vehicle blocks to ensure its utilization among all routes, including those two blocks serving the DAC. SBCAG is committed to the equitable distribution of BEB service and will incorporate demographic and environmental conditions into account when scheduling and deploying BEB.

SECTION G: WORKFORCE TRAINING

Making the transition to zero emission bus technology requires thorough training. Training is required to ensure staff can operate and maintain these vehicles in a safe and efficient manner. Training must also meet any applicable regulatory requirements, such as the Driver Proficiency requirements of California 13 CCR § 1229. SBCAG will implement specialized training for both behind-the-wheel training and bus maintenance practices for both BEB operators and maintenance staff; these training programs will be extended to any Clean Air Express contracted employees that may interact with the BEBs. Since BEB technology is still very new, training programs are both dynamic and flexible; as the technology advances, training programs will evolve. Training programs will include high voltage systems safety training, including lock-out/tag-out procedures and proper use of Personal Protective Equipment (PPE) for internal staff. SBCAG will also work with first responders to facilitate safety and vehicle familiarization training.

Both classroom and hands-on training are needed, but hands-on training is best for most topics and will be used whenever feasible. This allows for an apprenticeship model, where mechanics can learn from an expert. The details of the training that are required from the OEM will be included as a part of the vehicle procurement process and made a part of the RFP and contract, and will cover training hours, aids, materials, special tools, and diagnostic equipment.

In addition, concurrent with the introduction of BEB, SBCAG will incorporate budget funding to allow maintenance staff to complete coursework at the Southern California Regional Transit Training Consortium (SCR TTC). After reviewing the training provided by the OEM, SBCAG will supplement the training by having appropriate maintenance staff complete training provided by SCR TTC as suitable; potentially including their programs EV Transit Bus Safety Awareness and Familiarization SC-BEB-5000-I (EV Transit Bus Safety Awareness and Familiarization); E2-Electrical II for Transit SC-EL-1600-II (Advanced Electrical Systems on Transit); E3-Electrical III for Transit SC-EL-1600-III (Network Communication-Introduction to PLC and Data Networks); and E4-Electrical IV for Transit SC-EL-1600-IV (PLC/IO Systems Diagnostics); or their equivalent.

Operations supervisors will complete their EV Transit Bus Safety Awareness and Familiarization course, which will provide a general understanding of safety do's and don'ts when working around electric high voltage transit vehicles. The supervisors will then train all bus operators in bus safety awareness.

BEB training provided by a combination of the selected battery powered vehicle and electric charger OEM and classes provided by the SCR TTC with a focus in the following areas:

1. Charging infrastructure maintenance training
2. General bus overview introductory training
3. High voltage safety training
4. Bus maintenance, troubleshooting, and repair training
5. Emergency first responder training

The following provides a list of personnel and positions that will need to be retrained upon adoption of ZEB (this list is not exhaustive):

- Bus Operators. Bus operators will need to be familiarized with the electric buses, safety, bus operations, and charging operations. (15)
- Mechanics and Maintenance Staff. Mechanics and maintenance staff will need to be familiarized with scheduled and unscheduled repairs, high-voltage systems, and specific maintenance and repair of equipment. (5)
- Agency and Service Contractor Managers and Trainers (3)
- First Responders. Santa Barbara County and City Fire Departments and County Sheriff, CHP and Police Department representatives will need to be familiarized with the new electric buses and supporting facilities. (8 agencies)

SECTION H: POTENTIAL FUNDING SOURCES

Due to limited formula funding and the uncertain nature of transit funding, in general, SBCAG will need to constantly monitor notices of funding opportunities and pursue grant opportunities vigorously. SBCAG has identified multiple potential federal, state and local funding sources to implement this ZEB Rollout Plan. New funding opportunities will be evaluated and pursued as they arise. SBCAG intends to use multiple local sources as a match for this project, as needed.

The following reflects the grant funding and incentive programs available as of January 2023 and is not all inclusive.

Federal Programs

- *FTA Funding:*
 - *Section 5307: Urbanized Area Formula Grants*
 - *Section 5339(a): Bus and Bus Facilities Formula Program*
 - *Section 5339(b): Bus and Bus Facilities Grant Program*
 - *Section 5339(c): Low-No Emission Vehicle Grant Program*
- *Other US DOT*
 - *RAISE, MPDG, SMART*

State Programs

- *Transit and Intercity Rail Capital Program (TIRCP)*
- *Low Carbon Transit Operation Program (LCTOP)*
- *SB1 Local Partnership Program (LPP)*
- *SB1 Solutions for Congested Corridors (SCCP)*
- *Affordable Housing and Sustainable Communities Program (AHSC)*
- *Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)*
- *Low Carbon Fuel Standard (LCFS)*
- *Caltrans State of Good Repair (SOGR)*
- *Volkswagen Environmental Mitigation Trust*
- *CARB - Carl Moyer Memorial Program*
- *Active Transportation Program (ATP)*
- *Sustainable Transportation Equity Project (STEP)*
- *Transportation Development Act*
 - *Local Transportation Fund (LTF)*
 - *State Transit Assistance (STA)*
- *California Energy Commission – Energize Program*

Local / Regional

- *Santa Barbara County Local Sales Tax - Measure A*
- *Central Coast Community Energy (3CE) – Electric Bus Program*

SECTION I: START-UP AND SCALE-UP CHALLENGES

The SBCAG Clean Air Express ZEB Rollout Plan will serve as a guide for the ZEB transition. There are some significant unknowns that will impact implementation over the next decade, including the changes in battery and charger technology, funding programs, and costs as the BEB technology matures, and as more manufacturers enter the market. ZEB have not been on the road in great numbers for long enough to fully understand and predict performance, reliability and robustness, and the technology is continuously improving. Further complicating that ZEB technology is evolving at a rapid pace, which complicates operations and maintenance with compatibility of components and charging infrastructure.

On a long-term basis, the biggest challenge faced by SBCAG is securing the essential funding to construct and maintain the infrastructure necessary to support a BEB fleet. While this plan has identified potential funding sources and adopts a phased approach, the investment in vehicles and required infrastructure is significant. **Considerable funding will be required to complete the ZEB transition, which presents a challenge to SBCAG and the Clean Air Express which does not currently receive FTA formula funding.** Zero-emission motor coach buses are more expensive than conventional buses, and new infrastructure is required to operate and maintain these vehicles. There have been some additional federal formula transit funding provided in the IJA, as well as new programs at the State, and Federal level that will help to fund a portion of the increased costs, *should SBCAG become eligible for these funds*. However, SBCAG traditionally has not been a recipient of federal formula funds and only local transit agencies receive them. Partnerships within the region will be critical to leveraging limited funding. It is also unclear if this additional funding will be sustained over time. Beginning 2029, SBCAG will only be able to purchase ZEB. At the same time, some of the existing programs, such as the VW Mitigation Program are ineligible to be used to meet state and federal mandates (implementation before the mandate occurs are eligible). It is also uncertain if the FTA “Low-No” program will be included in the next federal authorizing act, and at what level, or what other state and federal resources will be available.

There is some expectation that BEB costs will decrease compared to the cost of conventional buses as the technology matures and the number of manufactures increases. This was the original expectation when CARB regulations required a shift from diesel to CNG for certain air basins. However, a significant cost difference still exists between those two fuel paths. As a result, SBCAG is not basing its plans and expectations on a reduction in BEB over the next decade. Some studies show that the maintenance costs for BEB are lower than a bus equipped with a combustion engine or HFCB. It should be noted that these studies are based on a relatively small sample of ZEB and over a limited period of time.

Presently, there are limited number of BEB motor coaches that have met the FTA mandatory criteria, including “Altoona Testing.” There are a limited number of BEB models and manufactures, and at the same time State regulations and Federal priorities are causing an increased demand. Even if SBCAG is able to fund the increased cost of the BEB for Clean Air Express, it may be forced to operate its renewable diesel motor coaches beyond their useful life due to limitations with production.

SBCAG’s Clean Air Express ZEB Rollout Plan is a living document meant to guide the implementation of zero-emission bus fleets and help the agency work through many of the potential challenges to explore solutions. The plan provides estimated timelines based on best available information for bus purchases, infrastructure upgrades, and workforce training. SBCAG may update the plan as needed with the most current information and industry best practices.

APPENDIX A: BOARD OF DIRECTORS ADOPTING RESOLUTION

A RESOLUTION OF THE SANTA BARBARA
COUNTY ASSOCIATION OF GOVERNMENTS

APPROVING OF THE ZERO EMISSION BUS (ZEB)
ROLLOUT PLAN FOR THE CLEAN AIR EXPRESS BUS
SERVICE AND AUTHORIZING THE EXECUTIVE DIRECTOR
TO SUBMIT THE ZEB ROLLOUT PLAN TO THE
CALIFORNIA AIR RESOURCES BOARD IN ACCORDANCE
WITH THE INNOVATIVE CLEAN TRANSIT REGULATIONS

RESOLUTION NO. 23-22

WHEREAS, the State of California continues to adopt climate, energy and transportation goals, policies, and programs to improve air quality, especially by reducing greenhouse gases; reduce health impacts from emissions; and to develop a strong clean energy economy that creates sustainable jobs; and

WHEREAS, the California Air Resources Board (CARB) adopted the Innovative Clean Transit (ICT) regulation on December 14, 2018; and

WHEREAS, the Santa Barbara County Association of Governments operates the regional transit Clean Air Express bus services between northern Santa Barbara County and southern Santa Barbara County; and

WHEREAS, per ICT regulation the Santa Barbara County Association of Governments in its operation of the Clean Air Express is subject to small transit agency requirements because it does not operate more than 65 buses in annual maximum service (13 CCR § 2023(b)); and

WHEREAS, the ICT regulation requires small transit agencies in the State of California to begin to purchase zero emission buses (ZEB) as soon as 2026, with the goal of transitioning all transit buses in California to zero -emission technology by 2040 (13 CCR § 2023.1); and

WHEREAS, a Zero Emissions Bus Rollout Plan must be approved by its governing Board by July 1, 2023 (13 CCR § 2023.1(d)); and

WHEREAS, the Zero-Emission Bus Rollout Plan sets forth the Clean Air Express plan which meets the following requirements:

- A goal of full transition to zero-emission buses by 2040 with careful planning that avoids early retirement of conventional internal combustion engine buses;
- Identification of the types of zero-emission bus technologies Clean Air Express is planning to deploy;
- A schedule for zero-emission and conventional internal combustion engine bus purchases and lease options;
- A schedule for conversion of conventional internal combustion engine buses to zero-emission technologies;
- A schedule for construction of facilities and infrastructure modifications or upgrades, including charging, fueling, and maintenance facilities, to deploy and maintain zero-emission buses;
- Explanation of how Clean Air Express plans to deploy zero-emission buses in Disadvantaged

Communities;

- A training plan and schedule for zero-emission bus operators and maintenance and repair staff; and
- Identification of potential funding sources. (13 CCR § 2023.1(d).)

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Santa Barbara County Association of Governments hereby approves the Clean Air Express Zero-Emission Bus Rollout Plan as set forth in full and authorizes the Executive Director to submit the ZEB plan to CARB in accordance with the ICT regulations.

PASSED, APPROVED AND ADOPTED at the regular meeting of the Board of Directors of the Santa Barbara County Association of Governments held this 15th day of June 2023.


AYES: Williams, Capps, Hartmann, Nelson, Lavagnino, Infanti, C. Hernandez, King, Patino, Perotte, Clark, Rowse and Chair Osborne

NOES:

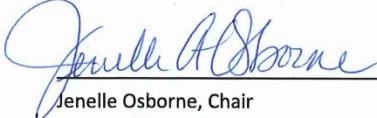
ABSENT:

ABSTAIN:

ATTEST:



Marjie Kirn
Executive Director



Jenelle Osborne, Chair
Santa Barbara County
Association of Governments

APPROVED AS TO FORM:
Rachel Van Mullem
County Counsel



Senior Deputy County Counsel